

turn is a continuation of U.S. Application Serial No. 07/776,803 filed on October 15, 1991, now abandoned. --

REMARKS

The Office Action which issued on April 6, 1994 has now been fully reviewed. In response, Applicant has amended the specification to indicate that the present application is a continuation-in-part of co-pending U.S. Application Serial No. 08/174,765 directed to the use of high acid ionomer resins to form the cover of golf balls. Since the '765 application is in turn a continuation of U.S. Application Serial No. 07/776,803 (now abandoned) it is believed that the present application is entitled to a priority filing date of October 15, 1991. In view of the above amendment and the following comments, reexamination and reconsideration of the subject application is respectfully requested.

A. The Invention

The present invention is directed to improved multi-layer golf ball cover compositions and the resulting multi-layer golf balls produced thereby. The novel multi-layer golf balls of the present invention include a first or inner layer or ply of a high acid (greater than 16 weight percent acid) ionomer or ionomer blend (such as that set forth in the '803 application filed on October 15, 1991). A second or outer layer or ply is included in the

multi-layered golf balls comprised of a comparatively softer, low modulus ionomer, ionomer blend or other non-ionomeric thermoplastic elastomer such as polyurethane, a polyester elastomer or a polyesteramide. Preferably, the outer cover layer includes a blend of hard and soft low acid (i.e. 16 weight percent acid or less) ionomers.

It has been found that the recently developed high acid ionomer based inner layer, provides for a substantial increase in resilience (i.e., enhanced distance) over known multi-layer covered balls. The softer outer layer provides for desirable "feel" and high spin rate characteristics while maintaining respectable resiliency. The soft outer layer allows the cover to deform more during impact and increases the area of contact between the club face and the cover, thereby imparting more spin on the ball.

Consequently, the overall combination of the inner and outer cover layers results in a golf ball having enhanced resilience (improved travel distance) and durability (i.e. cut resistance, etc.) characteristics while maintaining and in many instances, improving the balls playability properties.

Along these lines, the combination of a high acid ionomer or ionomer blend inner cover layer with a soft, relatively low modulus ionomer, ionomer blend or other non-ionomeric thermoplastic elastomer outer cover layer provides for excellent overall coefficient of restitution

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(i.e., excellent resilience) because of the improved resiliency produced by the inner cover layer. While some improvement in resiliency is also produced by the outer cover layer, the outer cover layer generally provides for a more desirable feel and high spin, particularly at lower swing speeds with highly lofted clubs such as half wedge shots.

Although Spalding (the assignee of the present invention) and others had previously attempted to produce golf balls having multi-layered covers containing one or more ionomer resins exhibiting the overall distance, playability and durability characteristics desired, such attempts have been generally unsuccessful in comparison with the present invention. For example, Spalding in U.S. Patent No. 4,431,193 (Nesbitt) disclosed a multi-layer golf ball which is produced by initially molding a first cover layer on a spherical core and then adding a second layer. The first layer is comprised of a hard, high flexural modulus resinous material such as type 1605 Surlyn® (now designated Surlyn® 8940). Type 1605 Surlyn® (Surlyn® 8940) is a sodium ion based low acid (less than or equal to 15 weight percent methacrylic acid) ionomer resin having a flexural modulus of about 51,000 psi. An outer layer of a comparatively soft, low flexural modulus resinous material such as type 1855 Surlyn® (now designated Surlyn® 9020) is molded over the inner cover layer. Type 1855 Surlyn® (Surlyn® 9020) is a zinc ion based low acid (10 weight

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percent methacrylic acid) ionomer resin having a flexural modulus of about 14,000 psi.

The Nesbitt '193 patent teaches that the hard, high flexural modulus resin which comprises the first layer provides for a gain in coefficient of restitution over the coefficient of restitution of the core. The relatively soft, low flexural modulus outer layer provides essentially no gain in the coefficient of restitution but provides for the advantageous "feel" and playing characteristics of a balata covered golf ball.

Unfortunately, however, while a ball of the Nesbitt '193 patent does exhibit some enhanced playability characteristics with slightly improved distance (i.e. enhanced C.O.R. values) over a number of other known multi-layered balls, the ball suffers from poor cut resistance and relatively short distance (i.e. lower C.O.R. values) when compared to two-piece, single cover layer balls. These undesirable properties make the ball produced in accordance with the Nesbitt '193 patent unacceptable by today's standards.

The deficiencies of the balls of the Nesbitt '193 patent are shown in the comparative examples included in the present application. For example, the coefficient of restitution of the golf ball having an inner cover layer taught by the Nesbitt '193 patent (i.e., inner layer composition "D" in the Examples) is substantially lower than the C.O.R. of the golf balls of the present invention.

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Moreover, the multi-layer balls disclosed in the Nesbitt '193 patent suffer substantially in durability and distance in comparison with the balls of the instant invention. See the data for prior art ball 5 (i.e., the Nesbitt '193 patent) disclosed in Table 8 and prior art ball 7 in Table 9. Since the Nesbitt '193 ball suffers from high softness, high cut resistance, low C.O.R. and low distance, the Nesbitt '193 ball is unacceptable in comparison to the present invention.

B. The Office Action

In the Office Action, the Examiner rejected the pending claims (i.e., claims 1-13) under 35 U.S.C. §103 as being obvious and unpatentable over the Nesbitt '193 patent in view of Nakamura (U.S. Patent No. 5,068,151, issued on November 26, 1991). Specifically, the Examiner stated:

Nesbitt discloses the claimed invention with the exception of the particular materials utilized. However, one of ordinary skill in the art would in view of Nesbitt's disclosure recognize that other known materials could have been utilized in the invention so long as the cover comprised a harder inner layer overlaid by a softer outer layer. As disclosed by Nakamura the use of high acid ionomers is known in the art. It would have been obvious to one of ordinary skill in the art to utilize the known

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materials recited by the applicant in the relation suggested by Nesbitt absent a showing of unexpected results, (Claims 1-4 and 6-13).

Concerning claim 5, it would have been obvious to one of ordinary skill in the art to have increased the thicknesses of Nesbitt's layers to increase the durability of the ball.

However, since the present invention is clearly distinguishable over the reference cited, the Applicant respectfully requests reconsideration of the obviousness rejections.

More particularly, the Examiner relies on the Nakamura '151 patent for the inference that the use for high acid ionomer resins is known in the art. While the Nakamura reference may be easily removed by the filing of a 37 C.F.R. §1.131 Affidavit showing Applicant's actual reduction to practice dates, etc., as clearly indicated below, this is unnecessary because the Nakamura '151 patent fails to disclose or remotely suggest, the multi-layered golf balls of the present invention.

In this regard, Nakamura relates to low acid, as opposed to high acid ionomer blends. Although the reference briefly suggests that the acid content of the ionomer resin utilized may be of 5% or 10% to 20% by weight, it was not until fairly recently (i.e. January 1, 1992) that ionomer resins containing greater than 16% by weight acid became commercially available.

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While patents in the field of golf ball production may assert fairly broad ionomer acid ranges such as those disclosed in Nakamura, to the Applicant's knowledge, no ionomer resins (i.e. ionomer resins having an acid content of greater than 16% by weight and most preferably from about 17% to about 25% by weight acid) were commercially available prior to January 1, 1992. This is supported by the Examples set forth in Nakamura wherein all of the ionomer resins utilized therein have acid contents of 15% by weight or less. For example, Nakamura is directed to cover compositions comprising a lithium ionomer resin combined with various di- or tri-valent metal ionomer resins. Essentially, HI-MILAN 1605, a sodium ion neutralized ionomer resin available from DuPont-Mitsui Polychemical Company, Ltd. having an acid content of 15% by weight is de-neutralized by nitric acid and then re-neutralized by various metallic salts. Further, various other low acid ionomer resins such as HI MILAN 1706 (15% by weight acid) and HI MILAN 1707 (15% by weight acid) are utilized in the examples disclosed in Nakamura.

Since Nakamura relates to low acid, as opposed to high acid ionomer blends, and fails to even remotely suggest the advantages (i.e. higher C.O.R. values, etc.) produced by the use of a combination of two or more specific high acid ionomer resins in golf ball cover production, this reference is deemed to be irrelevant to the multi-layered covers of the present invention.

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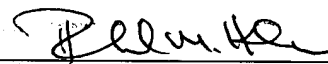
Further, if the Examiner has any doubts concerning the significance of the Nakamura '151 patent, this reference may be easily removed through the filing of a §1.131 Affidavit.

Accordingly, in view of the above amendments and comments, it is believed that all of the pending claims specify patentable subject matter over the prior art of record and are in condition for allowance.

The Applicant therefore respectfully requests an early favorable reconsideration and allowance of this application. If there are any outstanding issues which may be resolved by an interview or by an Examiner's Amendment, the Examiner is invited to call Applicant's representative at the telephone number shown below.

Respectfully submitted,

FAY, SHARPE, BEALL, FAGAN,
MINNICH & MCKEE



Richard M. Klein
Reg. No. 33,000
1100 Superior Avenue
Suite 700
Cleveland, OH 44114-2518
(216) 861-5582

Attorney for Applicant

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